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ABSTRACT

A study combined information from two national longitudinal surveys that have followed the life events of thousands of young people during and after high school and used multivariate regression analyses to create a profile of vocational graduates and outcomes of vocational education. The study used data from the National Longitudinal Survey of Labor Market Experience--New Youth Cohort and the High School and Beyond survey. Some of the findings of the study are the following: (1) vocational graduates make up 36-48 percent of all secondary graduates, with women usually outnumbering men; (2) students from families of lowest socioeconomic status are overrepresented in the vocational curriculum compared to their proportion in the general population; (3) less severely handicapped students are served by vocational education in proportion to their actual numbers; (4) about 42 percent of vocational graduates get first jobs related to their training; (5) the more credits earned in a vocational specialty and the higher the grades earned in that specialty, the greater the likelihood of getting and keeping a training-related job; (6) earnings advantages result to vocational graduates who develop a marketable skill and obtain a job related to that training; (7) participation in vocational education reduces the likelihood of students dropping out; and (8) gender differences are pronounced. Recommendations were made for further research, incentive to special groups, program continuation, and program development. (17 references) (KC)

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PARTICIPATION IN VOCATIONAL EDUCATION: AN OVERVIEW OF PATTERNS AND THEIR OUTCOMES

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U.S. DEPARTMENT OF EDUCATION
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FOREWORD

The findings presented in this overview of participation in vocational education are the results of research conducted at the National Center for Research in Vocational Education over the past several years. The purpose of the present report is to synthesize and summarize key findings from past efforts. Even though these studies stressed different objectives or intents, they all shared the underlying purpose of analyzing the effects of secondary vocational education. Labor market outcomes, postsecondary educational experiences, high school experiences, and noneconomic effects of vocational education were just a few of the broad research topics that served as major areas of investigation.

The two primary sources of data for the findings presented here are the National Longitudinal Survey of Labor Market Experience-New Youth Cohort and the High School and Beyond national survey. Both provide longitudinal data for nationally representative samples of young people during and since high school. The NLS-Youth survey was developed by the Center for Human Resource Research at The Ohio State University, with support from the U.S. Departments of Labor and Defense. The High School and Beyond longitudinal survey (HS&B) was funded by the National Center for Education Statistics.

Research for this project has been conducted under the direction and guidance of Paul B. Campbell, Senior Research Specialist in the Research and Development Division of the National Center. Suzanne Laughlin, Program Assistant, contributed to all phases of the preparation of this report. Monyeene Elliott served as project secretary and word processor for this report. External reviews of a preliminary draft were conducted by Madeleine Hemmings, Executive Director of the National Association of State Directors of Vocational Education, and Harry Silberman, Professor of Education, University of California at Los Angeles. Internal reviews were conducted by James Weber, Senior Research Specialist, and Mark Newton, Associate Director.

Ray D. Ryan
Executive Director
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in Vocational Education

EXECUTIVE SUMMARY

As credits required for high school graduation have increased or will increase in a majority of states, there is increasing concern for the place of electives in the secondary curriculum. Although vocational education comprises only one such group of courses, it is a major one.

The subject of the vocational curriculum, including its priorities, goals, and outcomes, has been debated since its inception. There seems to have been no clear "winner" in this debate. The pendulum of public opinion, as well as that of business, education, and research communities has swung in both directions over the years.

Although this overview does not purport to provide the definitive answer to all questions raised concerning participation in vocational education and its effects, it should assist readers in forming or clarifying their opinion. Information presented here is the result of recent research conducted at the National Center for Research in Vocational Education at The Ohio State University. The primary sources of information are two national longitudinal surveys that have followed the life events of thousands of young people during and since their high school experience. Some findings presented here are the result of descriptive tabulations; however, the majority are based on multivariate regression analyses which allow for simultaneous control of many extraneous (independent) variables. It is possible, then, to compare students with similar background characteristics and also see the contribution each variable is making to the dependent variable in question.

Descriptive Findings

- Vocational graduates make up 36-48 percent of all secondary graduates (dropouts and those with missing transcript data excluded).
- According to NLS-Youth data, women outnumber men in vocational education by a ratio of 3:2. Percentages from HS&B are nearly equal.
- Black, white, and Hispanic women have a greater tendency to be vocational Concentrators (specialize to the greatest degree) than their male counterparts (NLS-Youth).
- Students from families of lowest socioeconomic status are overrepresented in the vocational curriculum compared to their proportions in the general population.

- Limited English Proficient (LEP) students make up approximately 1 to 4 percent of the secondary vocational program enrollment. These low figures are perhaps an indication of barriers to participation for these students.

- The less severely handicapped (those who are mainstreamed and working toward a diploma) are being served by vocational education in approximate proportion to their numbers in the population.

- Transcript data indicate vocational students earn an average of 21.2 credits upon graduation compared to a total of 20.9 credits for nonvocational students.

- For approximately 42 percent of vocational graduates, their first job is related to their high school specialty.

- Specialization in the marketing program leads to relatively high percentages of first jobs that are training-related; however, there is a dramatic decrease in this percentage for current jobs.

- Black and white Trade and Industry graduates utilize their training in first and current jobs at approximately the same rate--42 percent.

Findings from Multivariate Analyses

- The more credits one earns in a vocational specialty and the higher the grades earned in that specialty, the greater the likelihood of getting and keeping a training-related job.

- The key to the earnings advantage for vocational graduates is sufficient concentration to develop a marketable skill and obtaining a job related to that training. The results are both hourly and monthly earnings advantages over graduates from the general curriculum.

- An estimated lifetime earnings advantage is projected for those graduates who earn a moderate level of vocational credits--that is, the Limited Concentrator. There is no such lifetime advantage projected for Concentrators (those with most intense specialization).

- Vocational graduates show a pattern of greater labor force participation and more weeks worked during the year than academic and general graduates of similar background.

- The evidence suggests that participation in vocational education reduces the likelihood of dropping out. Vocational courses are also utilized in many exemplary programs designed to bring dropouts back to school.

- Vocational education and a training-related job help to overcome some of the labor market disadvantages faced by blacks; however, their position is still not equivalent to that of the white male vocational graduate in terms of hourly wages, yearly earnings, weeks worked, and labor force participation.

- Hispanic graduates with the most intense vocational concentration showed hourly and monthly earnings advantages of 12 and 21 percent over Hispanic graduates from the general curriculum.

- Gender differences in earnings are quite pronounced. Specialization in vocational education ameliorates this disadvantage to a degree, but is not great enough to overcome the gender disadvantage.

- High school vocational education appears to make a significant economic contribution for low SES students <u>provided</u> they graduate and obtain a training-related job.

- Findings are mixed regarding the effects of working during high school on such factors as achievement and behavior.

Recommendations

The recommendations that follow are suggested both by the research reported in this paper and by the experiences of the staff who have been studying these topics for the past several years. The recommendations presented to either maintain the positive outcomes observed or to deal with the problems identified. They are focused on four general areas.

Research

- We recommend that the federal government improve and enlarge its data collection efforts and also provide an adequate source of funding for analysis of the data.

- We recommend that states establish or maintain units that can collect individual data on the school and labor market performance of high school graduates, and that they make available to local education agencies the technical personnel to assist and advise on adequate evaluation of local programs.

- We recommend that local agencies be alert for opportunities to collaborate with other schools to conduct larger scale research efforts, while conducting a systematic follow up and review of each of their own programs.

Incentives for Services to Special Groups

- At the federal level, we recommend a continuation of the present emphasis in the Carl Perkins Act, but also a major national effort to educate the local and state service deliverers on the nature and breadth of the problem for the disadvantaged and other population groups with special needs, and specific ways to use local resources to serve them.

- We recommend that state leverages through budget control be directed toward improved awareness, improved counseling, enriched instructional programs, and program modification designed for preparation for better jobs for the special groups.

- At the local level, we recommend that attention be concentrated on using local resources to improve awareness of opportunities, provide support mechanisms involving the community, improve basic skills, provide genuine choice, and develop programs leading to better-paying jobs in the changing work place.

Program Continuation

- We recommend that the federal government maintain its incentives for program improvement and also encourage through funding the search for workable ways to enhance the quality of basic education received by vocational graduates without destroying the quality of the vocationally specific education now being received.

- We recommend that state funding for vocational education be continued and that graduation requirements be constructed to preserve the option of completing sufficient vocational courses to continue the benefits of such a program.

- At the local level, we recommend that recognitions, progress reports, follow up reports, and evaluations be published in newsletters and the local media on a regular basis.

Program Development

- We recommend that states encourage innovative instructional programs through providing incentive funding, establishing networks of available experts who can assist local

agencies in developing programs, and recognizing these programs as they become operational.

- We recommend that local agencies develop ways to integrate academic and vocational learning, that counseling be enlarged to include a component on employment, and that employer-teacher interaction be encouraged by policies such as job interchanges, released time, and employer school visits.

INTRODUCTION

The educational reform movement has generated much debate on the appropriate role of the vocational curriculum in secondary education. There are those who argue for its exclusion from the secondary curriculum altogether, leaving it up to the postsecondary system to educate and train students for future careers. On the other hand, those who see the role of secondary vocational education as being much broader than delivering specific occupational training, argue for its necessity and educational value not only to a few, but to all high school students. The integration of more basic skills into the content of vocational courses, and, just as important, the incorporation of vocational examples to teach the relevance of topics in academic classes, are concepts stemming from this debate with important implications for vocational teachers and students, as well as policymakers.

To best serve the total needs of the individual, educators should examine the merits of both curricula and strive, not to separate, but to integrate, the "best of both worlds" for the benefit of their students. Upon graduation, a student should possess an optimum mix of the skills and knowledge to be able to pursue more than one option or deal with unexpected changes in his or her circumstances. Many graduates pursue a combination of work and education after high school; their secondary experience should make it easier to do so.

If the vocational system is allowed to die or is removed from the high schools, do we have something better to offer in its place? What becomes of the thousands of students who use it now either as a major field of study or as a source of useful electives? Is our society prepared to pay for more years of school for every student? For students without the opportunity to pursue postsecondary training/education, their high school experience offers their "best shot" (and perhaps their only "shot") for acquiring a foothold in the labor market as well as receiving a high school education.

For many others vocational education may provide an even more fundamental benefit--a high school diploma. We do not know the full extent to which vocational education keeps students in school who might have otherwise dropped out. However, current evidence does exist that suggests the beneficial role of vocational education in dropout prevention (Weber 1988). In addition, many successful programs designed to bring dropouts back to school employ vocational education as an important part of their overall treatment (Weber 1986).

The other side of this coin is that the alternative path through high school offered by vocational education, is also a path to postsecondary education. Over 60 percent of high school graduates who concentrated to a significant degree in a vocational specialty attend a postsecondary program as well (Laughlin 1986).

The most frequently chosen form of postsecondary education is the 4-year college or university. The vocational concentrators are more likely than general or academic graduates to attend vocational or technical schools, but not as frequently as they attend the 4-year schools. Their success rates in these schools are equal to that of general graduates, and only 8 percentage points less than academic graduates. This is quite remarkable considering that they tend to have lower test scores and come from families of lower SES than the academic graduates.

Furthermore, we do not know the contribution to overall "quality of life" that taking vocationally oriented classes might add. Much has been written (and intuitively felt) regarding the value of creativity, working with one's hands and mind, and the satisfaction and sense of accomplishment gained from seeing a project through from beginning to end. That these concepts have not been measured and quantified in research to date, does not mean that they do not exist or that they did not play a part in many individual decisions to participate in vocational classes. John Dewey's original intention for "hands on" learning was to use it as an integral part of the entire educational process, realizing its value not only to the individual but to society itself.

We do know, however, that a large majority of students take at least one vocational course during their high school careers. Knowledge of the value of that experience can best be gained through a combination of quantitative study, such as this report presents, and a collection and analysis of individual testimony attesting to the quality or value of the vocational education experience or its lack thereof, which is not currently available.

For all that we do not know about vocational education, there are many things we do know. The next two sections detail the highlights of this knowledge.

I. DESCRIPTIVE TABULATIONS

Data Source

Two national longitudinal data bases, The National Longitudinal Survey of Labor Market Experience-New Youth Cohort (NLS-Youth) and the High School and Beyond (HS&B), were analyzed to determine enrollment in secondary vocational, academic and general curricula, course-taking patterns, and participation rates in specific vocational specialties. Both surveys include transcript data from a subsample of respondents. The Center for Human Resource Research (CHRR), with support from the U.S. Departments of Labor and Defense, initiated the NLS-Youth data collection in 1979. The HS&B was the second longitudinal survey supported by the National Center for Education Statistics (NCES). These two databases provide a broad and unique information base from which to examine the high school experiences of these respondents and to analyze life-cycle factors that may or may not influence the educational and labor market experiences of these students.

More than 12,000 youth were included in the NLS-Youth sample. They were selected by a household screening process in the fall of 1978; the New Youth Cohort is a national probability sample of youth who were between the ages of 14 and 21 when originally selected. Transcripts were collected in 1980 and 1981 for members of the sample who were 17 years or older at the 1979 or 1980 interview, and again in 1983 for the youngest members of the cohort. Respondents excluded were those in the military sample and those who attended foreign high schools. Follow-up interviews have been conducted annually through 1988.

The High School and Beyond survey was initiated in 1980 with a sample of 30,000 sophomores and 28,000 seniors enrolled in 1,015 public and private schools. The first follow-up interviews were conducted in 1982 with 30,000 1980 sophomores and 12,000 1980 seniors. Transcripts were collected in 1982, the sample consisting of 18,427 of the 30,000 sophomores included in the first follow-up. Surveys have been conducted every two years through 1986.

Patterns of Participation

A great deal of variety exists among the patterns of course-taking for students enrolled in vocational courses. That diversity and intensity of concentration has been captured in a classification scheme developed by Campbell et al. (1981) after a thorough

analysis of available high school transcript data from the NLS-Youth survey. Those students following the most intense course of vocational study (an average of 6 or more vocational credits in a single subject area) are classified as Concentrators. These students follow the specialty throughout most of their high school careers and continue in it until graduation. They are followed by the Limited Concentrators who earn an average of about 3 related vocational credits and are less likely to follow their specialty through the senior year. The third group of students, Concentrator/Explorers, enroll in slightly fewer courses (an average of 2.5 credits) and usually end specialization before their senior year. These three levels of course-taking patterns comprise a group of graduates who have taken enough vocational coursework that it can be assumed they had gained marketable skills. As measured in each database these groups exhibit percentages of 48 and 36 percent of all graduates. Taken separately, the Limited Concentrators are the largest of the three sub-groups constituting approximately 45 percent of the vocational graduates.

Two additional groups of vocational students have been identified and described by Campbell et al. (1981). Explorers are those whose vocational course-taking is characterized by diversity. They may have earned a substantial number of vocational credits, but they do not develop a vocational specialty. The final group, Incidental/Personals, are those students who take at least one vocational course during high school but do not develop a significant concentration.

Although classified as separate groups for ease of description and comparison, in actuality, an overlap with other curriculum classification does exist. A Limited Concentrator, for example, still earns the majority of the credits necessary for graduation in academic and/or general classes and other miscellaneous courses. Explorers and Incidental/Personals take a variety of courses other than their vocational selections and so could also be classified as either academic or general students.

The academic group, as defined by their course-taking behavior from transcript data, consists of students who have earned three or more credits each in English and math and two credits each in science and social studies. If two or more credits were earned in a foreign language, the math requirement was dropped to two credits. Data from both databases confirm the relative smallness of this group compared to the vocational and general groups. NLS-Youth tabulations based on transcript data from graduates indicate approximately 17 percent of students nationwide graduated from the academic or college prep curriculum while similar HS&B data indicate approximately 13 percent such graduates.

The third major group, students in the General curriculum, were so classified if their transcript information did not put them in either of the above categories. The General curriculum accounts for approximately 40 and 47 percent (depending upon the data base) of the secondary graduates when participation is based

on transcript data and the Explorers and Incidental/Personals are reclassified on the basis of their other coursework. It should be noted that dropouts were not included in the total samples for any of the groups described (see table 1).

The enrollment breakdown across major population groups (white, black, and Hispanic) indicates white men are most likely to enroll in the academic curriculum in both databases. White women, however, are most likely to enroll in vocational education. In the NLS-Youth survey, women outnumber men in vocational education by a ratio of 3:2. However, the percentages are nearly even in the HS&B data. White, black and Hispanic women in the NLS-Youth sample and white and black women in HS&B, show a slightly greater tendency to be vocational Concentrators than their male counterparts. This tendency dispels the popular notion of Concentrators as a "male" group. The distribution of each race/gender group among the Concentrator, Limited Concentrator, and Concentrator/Explorer patterns shows that the largest percentages are generally found in the Limited Concentrator pattern.

What about the areas of vocational specialization? Who enrolls and in what programs? Six broad vocational programs are offered, each containing an array of courses that may vary from one district or locale to another in terms of availability, content or focus. These broad specialities include: agriculture, business, health care, trade and industry, marketing, and occupational home economics. Of the six, business and trade and industry enroll the overwhelming majority of vocational students (80-90 percent). Within each of these two popular programs there is the well documented segregation of men and women. The majority of women in vocational education, regardless of race/ethnicity, enroll in business. The percentages of white, Hispanic, and black women who do so (81, 87, and 69 percent, respectively) confirm the gender segregation in this specialty where 85 percent of the participants are women.

Although the Trade & Industrial (T&I) program is smaller than business in terms of total numbers enrolled, it is the second largest specialty offered; eighty-five percent of its participants are male. For men, the most popular programs following T&I are business and agriculture; for women, there do not seem to be any clear-cut favorites other than business. For vocational men in the HS&B sample, over 50 percent are enrolled in trade and industry; the business specialty constitutes the other major area of male enrollment (approximately 33 percent). NLS-Youth figures confirm this large male enrollment in T&I (51 percent of vocational males) and the business specialties (23 percent of the vocational males). Although there is a fairly even distribution of men and women in marketing, it is not surprising to see an over-representation of men in agriculture and women predominating in health care and home economics.

TABLE 1

PERCENTAGES OF HIGH SCHOOL GRADUATES
FROM EACH CURRICULUM

DATA BASE	NLS		HS&B	
Curriculum	n	%	n	%
Academic	985	17	1157	12
General	3458	47	3586	40
Vocational	2629	36	4026	48
TOTAL	7072	100	8769	100

NOTES: These samples did not include dropouts or those with missing transcript data.

Incidental/Personals and Explorers have been reclassified as either academic or general depending upon their other coursework.

Percentages are weighted; numbers are unweighted.

Socioeconomic Status

Overall, proportionately more vocational students come from families in the lowest socioeconomic quartile (15 percent) as compared to those in general (12 percent) or academic (4 percent) curriculum. However, vocational education enrolls a majority of its students (61 percent) from the two highest levels (quartiles 3 and 4) with approximately one-third belonging to households in the third quartile. HS&B figures confirm the higher proportions of lower level SES vocational students. A closer look within the group of vocational students shows a tendency for Concentrators to come from the lowest SES households with 35 percent of all Concentrators in the lowest quartile and 65 percent in the lower two quartiles. The distribution of the Limited Concentrators and Concentrator/Explorers generally reflects the patterns of SES levels found in the General curriculum population with a fairly even distribution among the quartiles.

By comparison, the distribution by SES within the academic curriculum is far more skewed. Students in this group are most likely to be in the highest SES quartile (64 percent, NLS-Youth); furthermore, the two highest quartiles constitute 84 percent of the academic enrollment. HS&B transcript data show 48 percent of the academic students come from homes in the highest quartile, with close to three-fourths in the two highest quartiles.

Limited English Proficient (LEP)

Data regarding the Limited English Proficient population are relatively scarce. Even more rare is national-level enrollment information for those in the high school age group. Results from the Office of Civil Rights Vocational Education Civil Rights Survey in 1984 provide an estimate of 1 percent LEP enrollment in secondary vocational education programs. Campbell (1986) identified approximately 4 percent of the NLS-Youth sample as LEP and less than 2 percent of the HS&B sample as such. These figures reflect data collected in 1979 and 1980 as part of the base year surveys. As immigration continues and the native nonEnglish speaking population expands, there will inevitably be increases in these percentages. Not all, of course, are limited in their understanding and use of English; however, the increasing numbers who require special instruction present a unique challenge to the educational community.

Tabulations from HS&B and NLS-Youth can provide an estimate of secondary LEP enrollment; however, sample sizes are quite small. Within these samples, Asian students exhibited the highest percentages of limited English proficiency with 19 percent of Asian males and 16 percent of Asian females reporting themselves to be in this group. Hispanic males were between 7 and 11 percent LEP depending upon the database, with 9 percent Hispanic females classified as LEP in both surveys. HS&B figures indicate the

highest percentage of LEP students were enrolled in home economics, while NLS-Youth data identify health care as the specialty with the highest percentage of such students (Campbell et al. 1986). LEP students tend to be concentrated in the lowest SES quartile. As SES increases, the number who report difficulties with English decreases.

Handicapped Students

The Perkins Act of 1984 emphasized the importance of vocational education's accessibility to special needs populations, including students with handicapping conditions. As defined by P.L. 94-142 (Education of All Handicapped Children Act) these types of handicaps include:

a) learning disabled

b) speech impaired

c) mentally retarded

d) emotionally disturbed

e) other health impaired

f) multihandicapped

g) orthopedic impaired

h) deaf and hard of hearing

i) visually handicapped

j) deaf-blind

Owings and Stocking (1985) have prepared a comprehensive report dealing with the handicapped students identified in the HS&B study. The following discussion is based upon their report.

The General Accounting Office (1981) reports that categories (a) through (d) accounted for over 80 percent of the elementary and secondary handicapped population in 1980-81 (cited by Owings and Stocking). The actual counts of children served through specialized educational programs, that is, provided with Individual Educational Plans (IEP's), are conducted through the Office of Civil Rights (OCR) and by education authorities in the states through the Office of Special Education and Rehabilitative Services (OSERS). The OCR survey of 1980 estimated 8.3 percent of the 41.2 million elementary and secondary students are handicapped according to school officials. It is very difficult to obtain an exact count of the number of high school age students due to varying definitions of handicapped and the practice of combining elementary and secondary figures. A study by Research Triangle

Institute in 1979 found that the older the age group, the less likely they were to be provided with IEP's. Therefore, estimates of the size of the secondary population may often be less than accurate. Many students lacking IEP's would not be identified by the system and therefore, would not be included in the counts.

It is also possible to obtain information about a portion of the high school aged handicapped population through one of the national longitudinal surveys. The HS&B questionnaire allows the user to identify students who reported themselves as handicapped according to set of criteria very similar to the one utilized by the federal government. It further allows the user to identify course-taking behavior for these students. In addition, the survey instrument asks the students if they had been enrolled in a special program for the physically handicapped and whether they had used, or planned to use, Division of Vocational Rehabilitation Educational Benefits to pay for college.

It should be noted that students in the HS&B sample represent those who are working toward a high school diploma as opposed to an attendance certificate or a certificate of completion. As such, they represent students who have been mainstreamed and/or have less severe handicaps. The HS&B sample did not include full time special education students or those enrolled in residential programs. In addition, students who would have been made to feel uncomfortable through participation in the survey were excluded at their teachers' recommendation.

Owings and Stocking point to the difficulty in determining accurately the handicapped secondary population. A most conservative estimate is based upon the percentages of students in both cohorts who identified themselves as handicapped in the base year survey and again in the first follow-up in 1982. These figures indicate four percent of the members of the senior cohort and six percent of those in the sophomore cohort were so identified. These percentages, however, do not include the students who reported themselves as handicapped in 1980 and not handicapped in 1982 or vice versa. Owings and Stocking report 17 percent of the senior cohort and 22 percent of the sophomore cohort answered inconsistently in response to the handicapped question. They hypothesize that considering oneself as "handicapped" can be a transitory condition rather than a permanent one. The authors go on to test their hypothesis using indicators of psychological state, self-esteem, achievement scores, grades, and teacher evaluations. Their results support their notion of the transitory nature of a handicapping condition. Students who identified themselves as such scored lower than the nonhandicapped group on measures of these variables and did experience problems in school. (For more detail, please see Owings and Stocking 1985.)

Campbell et al. (1986) used the following definition to identify handicapped students in the HS&B sample:

> student reported being in a special program for handicapped persons
>
> OR
>
> student reported having one or more of the conditions specified in the survey instrument and reported having a limiting condition.

Using data from the sophomore cohort Campbell identified a total of 12 percent as handicapped. Breaking out the sample by curriculum, one finds that the percentage of handicapped students in the top three categories of vocational course-taking is approximately 11 percent, a figure that very nearly equals the percent handicapped in the sample.

Enrollment figures for the general curriculum average 14 percent handicapped while the average for the academic curriculum is 7.5 percent. These figures indicate that vocational education seems to be serving this special subset of handicapped (those with less severe or "borderline" handicaps) in proportion to their numbers in the population. Handicapped students as defined by HS&B do seem to be slightly overrepresented in the general curriculum and quite underrepresented in the college prep curriculum.

Course Mix

Transcript data from NLS-Youth indicate that vocational students (Concentrators, Limited Concentrators, and Concentrator/Explorers), earn an overall average of 21.2 credits upon graduation. This total compares to an average of 20.9 for nonvocational students (see figure 1).

Concentrators, while earning the highest individual average number of graduation credits (21.7), earn an average of 5.4 credits less than nonvocational graduates in all of the subject areas except vocational education. Besides the category "other", differences are most appreciable in "foreign language" (-.8), "math" (-.7), and "science" (-.8). Differences between Concentrators and nonvocational students in "social science" and "language arts" credits earned are under .5. The Concentrators make up the differences by the relatively high average number of vocational credits (6.3) earned.

A Limited Concentrator, on the other hand, earns a more evenly balanced set of credits compared to that of the Concentrator. Overall, they average .2 credits more than nonvocational students upon graduation. Even though they earn 2.9 credits less than nonvocational students in a combination of all other courses except vocational education, they make up the difference (and gain

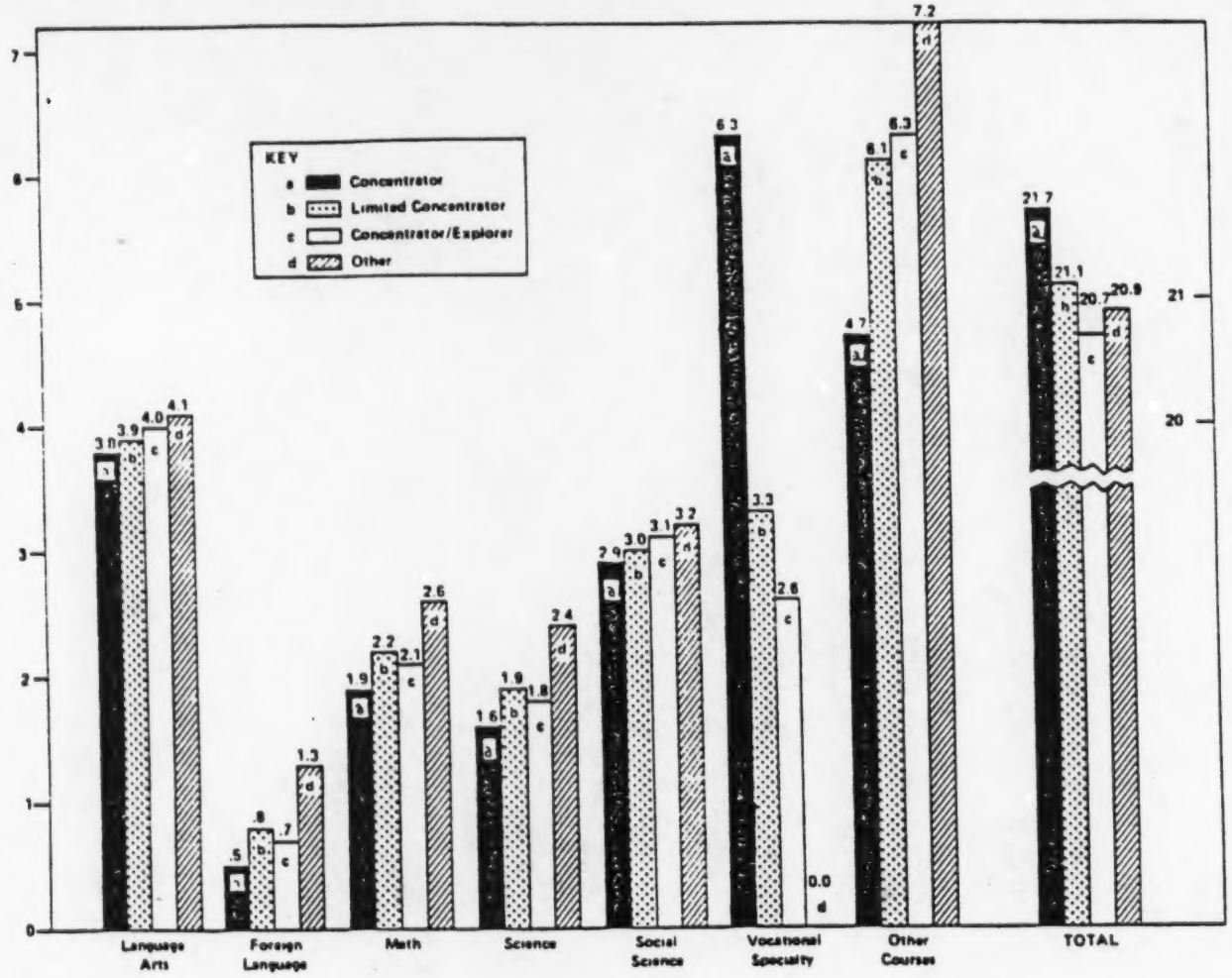

Figure 1. Course mix. Source: Outcomes of Vocational Education for Women, Minorities, the Handicapped, and the Poor, 1986.

somewhat) by earning an average of 3.3 vocational credits. A Limited Concentrator course-taking pattern allows the student to come very close to the nonvocational pattern and still obtain a marketable skill upon graduation. This pattern, perhaps, best captures the ideal of a dual diploma--one that allows vocational specialization and still provides the prerequisites for a post-secondary education. Analyses presented later in this report will discuss the beneficial role of this course-taking pattern on lifetime earnings and employment rates.

On average, Concentrator/Explorers earn an overall total of .2 credits less than nonvocational graduates. This pattern comes closest to the nonvocational pattern in the areas of "language arts," "social sciences," and "other courses." However, for "foreign language," "math," and "science," the Concentrator/Explorer earns slightly fewer credits than both Limited Concentrators and nonvocational students. On the whole, Concentrator/Explorers earn approximately 2.8 credits less than nonvocational students in a combination of all subject areas except vocational education. The next section presents the results associated with completing high school vocational programs in the years following graduation.

II. OUTCOMES

Effects of Vocational Education for all Vocational Graduates

The outcomes of vocational education are often measured in terms of the labor market experiences of its graduates, including wages, placement rates, and employment rates. Of equal importance, though, are the noneconomic effects of vocational education. The following sections report findings based primarily on multiple regression analyses that answer questions about both types of outcomes for vocational graduates.

Training-related Placement

One frequently stated or implied objective of high school vocational education is placement in a job related to the vocational specialty in which the student has concentrated. There is substantial evidence supporting the association of training-related job placement with labor market advantages in wages and earnings (e.g., Campbell et al. 1986; Gardner 1984; Rumberger and Daymont 1984). These will be discussed in detail in a subsequent section of this report. However, the actual job placement results are far from universally training related. For those who complete high school programs, about 42 percent secure a training-related first job. Two to five years out of high school, the current job, or if not working, the most recent job, is training related for 43 percent of vocationally trained high school graduates.

The vocational specialty and gender of the young person appears to have a pronounced effect on the likelihood of holding a training-related job. Men graduating with a business specialty have a 19 percent rate for first job, whereas women have a 41 percent rate. In trade and industry related job rates are 49 percent for men and 14 percent for women. These figures are for the first job held and they change somewhat as time in the labor force accumulates. Men in business related jobs move to 33 percent while women change their rate very little. Women in trade and industry related jobs increase their rate to 46 percent while men stay fairly constant. One other note of interest concerns the marketing curriculum related jobs. For first jobs, 40 percent of the men hold training related jobs and 49 percent of the women hold such jobs. Current jobs, however, are related for only 15 percent of the men and 29 percent of the women. A concentration in marketing appears to provide an entry point into the labor force, but does not serve as a career for most.

There are some differences in training-related placement rates among racial/ethnic groups. Blacks graduating with specialization in the business curriculum are more likely than not to have both first and current business related jobs (52 and 56 percent). Majority whites are below the overall average in

first-job training-relatedness, but about average in the current job (36 and 42 percent). Hispanics are below average in first jobs and more so in current jobs (36 and 33 percent). The trade and industry specialty is utilized in a related job about equally over time for blacks (48 and 45 percent) and also for majority whites (43 and 44 percent). Again Hispanics are the exception. They show the highest training-relatedness in the first job and it increases in the current job (55 and 63 percent). These unexplained differences should be investigated further to determine if program characteristics are responsible for the differential utility of high school vocational education for certain groups.

A number of other factors also appear to influence the likelihood of getting and keeping a training-related job. Holding constant the factors already discussed (e.g., gender, race/ethnicity, and specialty), several policy relevant points can be noted. These include occupational aspirations related to one's specialty, grade point average in the specialty, and level of concentration. For the latter two, the higher the average or level, the more likely that a related job will be obtained and held. These points suggest that knowing what one wants to do, and being motivated to do well at it, are major determinants of successful individual investment in the high school vocational program.

The source of these findings regarding training-related job placement is a study conducted at the National Center for Research in Vocational Education (Campbell et al. The Antecedents of Training-related Placement, 1987). This study defined training-related placement as jobs judged by a panel of experts to utilize the skills taught in the typical courses offered in programs in each specialty area. The match between programs and jobs, expressed in U.S. Census codes for the jobs, is published in the report, Vocational Preparation and Occupations, 3rd Edition, Vol. 1, Educational and Occupational Code Crosswalk, Washington, DC: National Occupational Information Coordinating Committee, 1982. A program is associated with multiple job census codes. If the reported job matched any code related to the program, the job was classified as training related.

The data sources for the study of antecedents were the two previously described national longitudinal databases. The primary data source for the study was the National Longitudinal Study of Labor Market Experience-New Youth. Another supporting source was the High School and Beyond survey, with analyses confined to the sophomore cohort. For details of the analysis, the reader is referred to the full report.

Wages and Earnings

There is considerable consistency in positive outcomes for wages and earnings among high school vocational education graduates when they are compared with others like themselves and they

are holding jobs related to their training. Five separate analyses of four different groupings of graduates from three different national longitudinal data bases produce uniformly positive percentages of hourly wages over graduates of the general and academic curricula. Among those who concentrate significantly in a vocational specialty, 9 of 10 estimates of advantage range between 5 and 10 percent. The remaining estimate, 4 percent, cannot be ruled out by conventional standards as a sampling artifact. In contrast, the percentage difference between academic and general graduates is frequently negative for the academic graduates, and never achieves an advantage of as much as 3 percent.

Monthly earnings present a similar picture. In this case, the advantage for vocational graduates ranges without exception from 10 to 16 percent when compared to graduates of the general curriculum. Even for those who have accumulated very limited vocational specialty credits (2-3), and work in jobs related to the specialty, the percentages are always positive, but range from 2 to 20 percent. Such a wide range does not inspire a great deal of confidence in the results for those with few credits, but the overall picture is one of earnings advantage.

One additional study provides an estimate of the effect of vocational education in high school on annual earnings (Campbell et al. Dynamics of Vocational Education Effects on Labor Market Outcomes, 1987). In this study, concentration in vocational education was considered as one factor, and training-related placement was considered as another factor. The result is still a test of the impact of vocational concentration because training relatedness by definition requires vocational concentration. That study shows an advantage of 43 percent in annual earnings for a person who entered and remained in a training-related job when compared to a person otherwise similar in age, gender, race/ethnicity, training, and other characteristics.

Estimated lifetime earnings also show an interesting advantage for vocational education pursued in the high school (Campbell et al. 1986). The combination of some vocational education in the high school and a variety of other courses available in high school is associated with a significant advantage in estimated lifetime earnings. In contrast with that advantage, those who concentrate the most in a vocational specialty do not differ in estimated lifetime earnings from those who graduate from a general curriculum. Even more surprising, those who graduate from an academic high school curriculum have a significant disadvantage in those earnings. These findings hold when the graduates of each curriculum are compared with others like themselves; that is, college graduates are compared with other college graduates, women are compared with women, and minorities are compared with minorities.

Employment and Unemployment

Employment rates may be reported as averages for a population at a specific point in time. This is the most commonly reported statistic. It provides a simple metric from which the health of the overall labor market may be inferred. It is also possible to estimate the effects of differing group membership on the employment rate. Doing so, however, requires acceptance of some difficult assumptions when the conditions of interest number more than two or three. Also, important information is missing from such an estimate. The length of periods of unemployment is unavailable, as well as the frequency. If longitudinal data on individuals is available, the periods of unemployment and their length can be averaged across individuals, permitting an estimate of average weeks worked rather than being limited to whether or not some individuals were working at the time of the interview. The increase or decrease in time spent in the labor force and working can then be examined in association with factors thought to be influential, and the contribution of these factors can be considered. The information reported next utilizes such data (Campbell et al. 1986).

High school graduates who have concentrated substantially in vocational education show a pattern of greater participation in the labor market and more weeks of employment during each year. Following an academic curriculum appears to work in the opposite direction. This conclusion holds when the comparisons are controlled for other plausible explanations such as postsecondary attendance. In other words, a graduate who was a vocational concentrator would, on the average, spend about 2 weeks more in the labor force in a given year than a general graduate, and about 4 weeks more than an academic graduate. Of this time in the labor force, about 2 weeks more would be spent actually working as opposed to looking for work, again compared with a general graduate, and 4 weeks, compared to an academic graduate. Adding these figures together suggests that the vocational concentrator is productive, or in the labor force and working, by a margin approximating 6 weeks in any given year when compared with an academic graduate (adjusting for the latter's lower time in the labor force). There is also evidence that the vocational Concentrators spend less time in part-time work, further substantiating the productive involvement of the vocationally educated young person.

Recall that these findings are from data collected fairly early in the working careers of the high school graduates, and may change over time. However, the earnings patterns reported earlier are consistent with these results and suggest a significant contribution for high school vocational education.

Noneconomic Benefits

Dropping out. Although the group of young people who concentrate in high school vocational courses contains more than the average number who are at risk of dropping out, there is some evidence that taking more vocational courses reduces that risk. Mertens and her colleagues (1982) found that among the high risk group, taking these courses improved the likelihood of staying in school from the ninth to tenth grade and from the eleventh to twelfth grade. As more courses were taken, there was also a very small increase in staying between the tenth and eleventh grades, but not enough to have confidence in that likelihood in the population as a whole. Weber's survey (1986) of exemplary dropout prevention programs finds that vocational education was a feature in most of them. Because vocational courses in the high school tend to be taken more often by those who have characteristics associated with dropping out, a judgment about the effectiveness of vocational education in reducing the dropout rate depends on carefully designed and controlled research which is yet to have been conducted.

High school achievement. There is some evidence that concentration in vocational courses is associated with reduced levels of academic achievement, but not in all programs. Hotchkiss (1984) found that vocational courses tended to deflate test scores slightly. The business curriculum, however, increased verbal test scores for women. A comparison of the test scores earned by the Sophomore Cohort of the High School and Beyond survey (figure 2), the same data as those analyzed by Hotchkiss, illustrates that the track effect implied by the Hotchkiss findings is quite minimal, although significant. The tests were administered both in the base year of the survey and two years later when the respondents were seniors. When the respondents are separated into the predominant curricula they followed, the differences in beginning and ending scores are very similar, except in mathematics. However, those in the general and vocational concentrations started at much lower levels than those who concentrated in academic subjects. The relative standing of the three groups remains effectively the same.

The noneconomic effects of high school vocational education are not well established by existing research and available data. This is an area requiring further study.

Effects of Vocational Education for At-Risk Groups

The evidence on the effects of vocational education in the high school is promising but incomplete for at-risk groups. In general, the results parallel those for the majority group, namely that there is a wage advantage for minority group members who have had high school vocational training and are employed in jobs

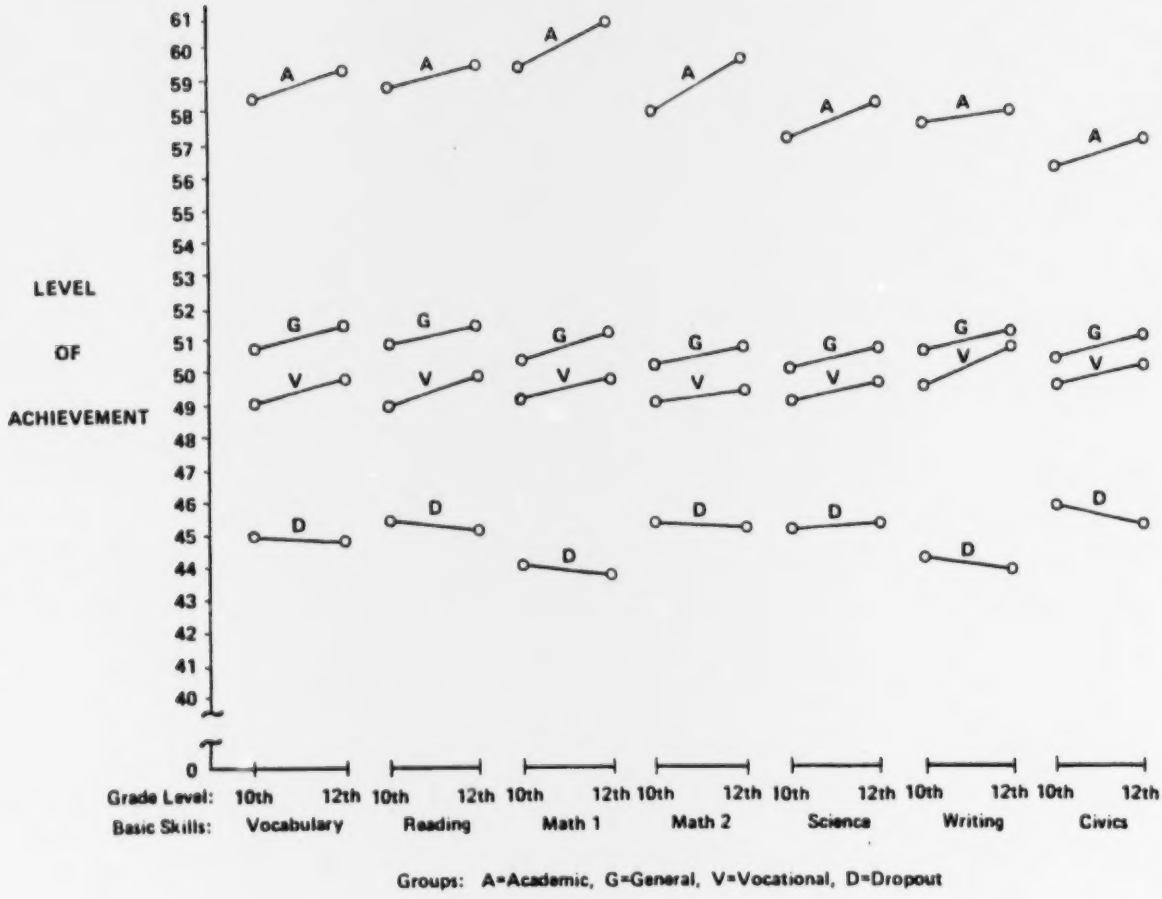

Figure 2. Comparative analysis of basic skills achievement (HS&B). Prepared by James M. Weber from HS&B data, 1986.

related to their training. Frequently, however, the sample sizes are small, raising the possibility that the findings may not hold in the population as a whole.

The at-risk groups for whom we have evidence include blacks, Hispanics, Native Americans, Asians, and women. There is an excellent case study on vocational education for those with Limited English Proficiency (LEP) (Friedenberg 1987). It was designed, however, to assess the quality of programs and their accessibility to LEP students, rather than to examine labor market effects for them. Each group will be discussed in turn.

Blacks

Wages and earnings. Although the wage advantage for black workers who concentrated in vocational education and have jobs related to their training ranges from 7 to 10 percent, the sample size is too small for a confident expectation that this advantage is generalizable to the population of blacks who are so trained and employed (Campbell et al. 1986). However, the magnitude of the advantage is virtually identical to that of the total sample. Further, no meaningful difference was found between the advantage for white men and black men in the total group. This suggests a strong possibility that the vocational program has similar pay-off for black men. The findings for black women will be discussed in detail in a later section, but it should be pointed out that they suffer a wage disadvantage in comparison to black men that parallels that found within other race and ethnic groups. Specifically, the wages of black women are from 7 to 13 percent less than those of black men, other conditions being equal.

Labor force participation and employment. In the analyses reported here, labor force participation was defined as the percentage of time after high school graduation spent working or looking for work. There were two separate analyses carried out, with two separate national samples. For all respondents, the rate of participation ranged from 4 to 10 percent over that for graduates of the general curriculum. The difference appears attributable to whether or not the analysis was conducted separately for those who held a training-related job. That group had the higher rate of participation. Among black men, the labor force participation rate averaged from 5 to 10 percentage points lower than that for majority white men. The analysis suggests that concentrating in a vocational specialty in high school approximately equalized labor force participation for black men and majority white male graduates of the general curriculum. The black men who concentrated remained at a disadvantage when compared with their white counterparts who had also concentrated in a vocational specialty in high school.

The situation for black women was similar. Their rate of participation was about 12 percent lower than that for majority white men and about 0 to 6 percent lower than that for white

women. The greater participation associated with vocational concentration offset this discrepancy somewhat, but was inadequate to remove it entirely.

Actual employment, expressed in the reported analyses as percentage of weeks worked, follows a similar pattern. Concentrating substantially in a vocational program increases actual working time 3 to 4 percent (about 2 weeks per year). For black men there is an associated decrease in employment from 2 to 10 percent and for black women the decrease in weeks worked is from from 5 to 14 percent. Vocational concentration offsets some of this disadvantage, but a significant discrepancy remains.

To summarize, even among these better educated black young people, (all in these analyses are high school graduates) there remain serious disadvantages in labor force participation and employment. Concentrating in a vocational specialty in high school ameliorates somewhat this disadvantage, but is not sufficient by itself to eliminate it. However, a vocational curriculum, followed with serious commitment in high school and then utilized in the labor market, is an option whose value should be communicated to students.

Hispanics

Wages and earnings. Only one database, The High School and Beyond, had a sufficient number of Hispanic vocational concentrators to derive any reliable conclusions. The analysis showed a wage advantage of nearly 12 percent for Hispanics who concentrated most intensely, when compared with Hispanic graduates of the general curriculum. The monthly earnings advantage was 21 percent. As with blacks, the sample size was small, but the percentages were close to those for all workers, suggesting that the results were not likely to be a sampling artifact. The disadvantage of being female was also large, as it was for blacks. A Hispanic woman who has concentrated intensely in a vocational specialty earns about the same wage as a Hispanic man who has graduated from the general curriculum.

Labor force participation and employment. Among those who have graduated from high school, Hispanic men do not differ significantly from majority white men in labor force participation or the percentage of weeks worked. Hispanics women, however, show a marked disadvantage in both labor force participation and percentage of weeks worked. In the latter case, the results are less consistent, with one database showing a disadvantage and the other showing no appreciable difference. For these women, concentrating in vocational education nearly offsets the labor market participation disadvantage.

Native Americans and Asians

Sample sizes for these two groups were insufficient to permit reliable separate analyses. They were included, however, in the general analyses. If one is willing to assume that high school vocational education does not interact in a unique way with members of these groups compared to majority whites, Hispanics, and blacks, some plausible inferences can be drawn.

Wages and earnings. Native American men do not show a consistent and reliable wage and earnings disadvantage when compared to majority white men, although most of the reported wages and earnings are somewhat lower. A larger sample might indeed confirm a genuine disadvantage. Lacking such evidence, it appears that vocational education will have the same approximate effect for both Native American and majority white men. The situation for Native American women is nearly identical to that of majority white women. Both show a substantial and consistent wage and earnings deficit when compared to their male counterparts. These two groups are at the greatest wage and earnings disadvantage among the at-risk populations.

The analyses yield an ambiguous picture for the Asians. This is because a number of unidentified others are included in the Asian group. For this combined group, monthly earnings show a consistent disadvantage among women, but hourly wages do not differ in a reliable way. For HS&B they do not differ, but in the NLS-Youth data they are lower. The results for men show no reliable deficit in either database.

Labor force participation and employment. Native Americans show less participation in the labor force than majority white men in both databases. The association is larger in HS&B than in the NLS-Youth data, but always in the direction of lower participation. The percentage of weeks worked shows a similar tendency, but not as pronounced. In only one case is the deficit large enough to be considered a reliable indicator of the situation in the population as a whole. That is for Native American women sampled in the NLS-Youth. They are likely to spend more time, either looking for work or on lay-off, than their majority white counterparts. The HS&B analysis did not confirm that result. However, the difference in percentage of weeks worked when in the labor force, although small, is always consistently lower. This suggests that an underemployment problem is present for these people even when they have completed high school. Further, as observed for the other groups, concentration in a vocational program in high school partially offsets this disadvantage in participation, and almost completely offsets it in percentage of weeks worked. Again, this is a promising observation, but not a sufficient one to stand alone.

The situation for the Asian group is more problematic, as previously described. Although the Asians make up a substantial majority of the group analyzed, the influence of the others on the

associations has not been accounted for. The data suggest, however, that there is very little difference between members of this combined group and majority white men in labor force participation and percentage of weeks worked.

These results are reported in Campbell et al. (1986). They must be taken as tentative, because of the problems noted. Although economic difficulties are suggested by these studies, it is encouraging to see that education has been at least partially effective. Continued attention to labor market results are, however, very appropriate.

Women

Some reference has been made to the effects of high school vocational education for women in the overall discussions and in the two major ethnic groups just discussed. The presence of pronounced differences between men and women in the outcomes noted in these discussions prompts a look at women exclusively, to determine whether there are important differences among them, as well as between men and women. Such differences do indeed occur.

Wages and earnings. For women, concentration in vocational education produces a wage advantage of a similar order to that of the whole group, including men. It is 8 to 10 percent for those in jobs related to their training. Also, a monthly earnings advantage is present. It ranges from 15 to 17 percent. For one sample, there is also an advantage for jobs not related to training. It is about half of that for the training-related jobs. In terms of economic returns, high school vocational education is a worthwhile investment for women, at least in the short term.

The most disadvantaged women are members of the majority white group. They earn wages that average from 4 to 7 percent less than Hispanic women, and about 6 percent less than black women who are otherwise similar. This finding is tempered by the observation that these women are all high school graduates. The more extreme rates of dropping out among blacks and Hispanics probably yields more motivated graduates among these populations. It may be unmeasured individual differences that produce the earnings advantages for female blacks and Hispanic graduates.

Labor force participation and employment. Depending upon which national sample one examines, white female high school graduates spend from 1 to 5 percent less time in the labor force than their white male counterparts. Among minority women, however, time in the labor force ranges from 1 to 18 percent less than majority white men (only the "other" category in the NLS-Youth is closer than 5 percent to majority white men). By way of comparison, the minority men show a smaller deviation from majority white men. Of eight possible comparisons (four minority groups

in two national samples), four range from 5 to 14 percent, and four range from 1 to 3 percent. Results from both national surveys suggest that among the younger cohorts, labor force participation is approaching equality between the sexes. There remains, however, a notable gap between the majority and the minorities, although the data are not consistent between the two data bases in this regard.

Generally, smaller differences from majority white men are observed in percentage of weeks that women worked. White women do not differ at all, whereas minority women occasionally show substantial deficits. The largest of these is found in the black female group, where there is a 14 percent deficit in one national sample. This figure is only 5 percent in the other sample. These results are similar to those for black men, who have employment as much as 10 percent below the white comparison group. The employment advantage associated with concentrating in a vocational program in high school reduces the employment deficit to a nonsignificant amount in the HS&B group, but cannot be estimated for the NLS-Youth group because of insufficient sample size for Concentrators.

The Low SES Group

The disadvantages of low socioeconomic status, or poverty, are many and well documented. For this group, the effects of high school vocational education are of considerable interest, because these students tend to be overrepresented in vocational programs. Two sets of analyses are available for these young people. The results are encouraging but not conclusive.

Labor force participation and employment. The analyses do not provide a direct result for the low SES respondents in terms of participation and employment. The difference subsequently cited in monthly earnings does suggest more regular employment for those in this group who have concentrated. This is consistent with the results for the total group, and suggests that the effect is similar across SES quartiles for those who concentrated in a vocational specialty.

Wages and earnings. Graduates with significant concentration in high school vocational education show small percentages of advantage in hourly wages over those who graduated from the general curriculum, provided they are holding training-related jobs. One analysis based on High School and Beyond data shows a 13 percent advantage over those without such training. The other, based on NLS-Youth data, shows a 5 to 9 percent advantage, depending upon the degree of concentration, but the numbers are too few to be confident about the representativeness of the sample. In those data, however, the monthly earnings for concentrators show a substantial and significant advantage of 24 percent, evidence of working more hours and experiencing less unemployment. Overall then, it appears quite likely that high

school vocational education makes a significant economic contribution to those from poor families if they persist through school and find jobs using their training.

Persons with Limited English Proficiency

Analysis of longitudinal data has produced little information about the effects of high school vocational education for persons with a limited command of English. This may be true because there are an insufficient number of graduates who have completed a vocational program in high school. The best information available on this issue (Friedenberg 1987) suggests that there are severe problems of access to vocational programs for those of Limited English Proficiency (LEP). This may account for the limited numbers represented in the longitudinal data bases. There is little reason to believe that vocational education would work less well for LEP persons. To do so requires an assumption that the skills and attitudes involved in an occupationally specific setting are dependent on the English language.

The problem, then, is one of a properly supportive learning environment and freedom from any discriminatory practices in access or instruction. Friedenberg summarizes a list of recommended practices that go far toward resolving this problem. These are:

- Recruitment that is targeted specifically for LEP individuals. (Example: Providing promotional information in the potential trainees' native languages)

- Intake and assessment procedures that are appropriate for LEP individuals and are diagnostic rather than exclusionary. (Example: Including the testing of English language proficiency, native language proficiency, and vocational interest and aptitude in the native language)

- Bilingual vocational instruction that does not require students to learn English before they can begin learning a trade. (Examples: Having a vocational teacher who speaks the students' native language and who is properly trained to work with LEP students; providing bilingual training materials)

- Vocational English as a second language (VESL) instruction that is taught by a trained English as a second language (ESL) instructor and that focuses specifically on the vocational area(s) of the students. (Examples: Auto mechanics ESL, food services ESL, cosmetology ESL)

- Counseling and support services that take the special needs of LEP students into account. (Examples: Making available appropriate referrals to ethnic Community Based Organizations and agencies that can provide immigration

counseling and social and health services in the native language; providing bilingual and culturally sensitive personnel and professional counseling)

- Job development and placement that take the special needs of LEP individuals into account. (Example: Forseeing and counseling for employability problems arising from cultural differences; preparing employers for LEP and/or culturally different employees)

- Coordination of the above six elements that ensures mutual support. (Example: Making sure the ESL classes are coordinated with vocational instruction so that the ESL instructor is teaching the vocabulary and grammar used in the vocational classes)

These practices should help to ensure that the benefits of high school vocational education are truly available to LEP students. The results can then be examined to determine the efficacy of the instruction.

High School Work Experience

Two studies using national longitudinal data have examined the nature and effects of working while in high school (Lewis, Gardner, and Seitz 1983; Hotchkiss 1983). These studies document the fact that working while in high school is widespread. About two-thirds of all students worked while in high school, not counting summer or odd-job employment. Most of the jobs were self-obtained, only about 15 percent were school supervised. Most of the jobs involved lower skill levels; however, those that were school supervised tended to require higher skill levels, especially for women. Also, concentration in vocational education tended to be associated with increases in the skill level of the employment. The well-documented pay disadvantage for women was evident in the self-obtained jobs, but pay was equal between men and women for school supervised jobs.

The studies reported some differing results on the effects that working in high school might have on grades. For men, no effect was found, either on grades or class rank. For women, however, working appeared to negatively influence grade point average, but had a positive influence on class rank. Because these two measures are by definition and practice highly related, it appears likely that some form of measurement error must account for the difference. The authors advance the plausible argument that class rank is the more reliable measure because it is independent of between-school variations in grading practices. The overall conclusion reached is that working has either no effect on achievement, or a slightly positive one.

Lewis and his colleagues also found a somewhat disturbing result. It is quite moderate, or it would be very disturbing. There is some tendency for working young people to engage in more anti-social behavior such as shoplifting, using marijuana, cutting classes, and other school related problems. The group most likely to engage in these kinds of activities had both school supervised and school independent jobs. However, a subsequent analysis (Hotchkiss 1983) with a different set of data did not find such a result.

The final observation on the effects of working while in high school pertains to after-high school employment. Only the Lewis et al. study addresses this issue. They found no wage effects for high school work, but they did find that unemployment was reduced among those who had high school work experience.

The results of both of these studies can be summarized by the statement Hotchkiss makes on regarding the effects of working in high school. He says ". . . the time high school students spend at part-time jobs does not effect their school behaviors or performance" (Hotchkiss 1983, p. 2).

III. RECOMMENDATIONS

Vocational Education is offered at the local level. The role of the State and Federal governments is to establish policy that enables, encourages, and channels funding toward societal problems in need of solutions. Against the backdrop of findings presented in the previous sections of this paper, the recommendations for policy are offered for each level in turn, beginning with the most remote, the Federal government.

At the Federal Level

Research. The findings that have been presented frequently refute popularly held misconceptions about the nature and availability of high school vocational education. To create policy that will enable, encourage, and properly channel the local provision of vocational education, a continuing effort at monitoring and evaluating the operation and nature of vocational education is essential. It can best be carried out at the national level because the efficiencies of large scale data collections are necessary to acquire the needed information. Also, the states can then have a comparison group against which to evaluate the performance of their own efforts. The federal government has attempted to fulfill this role since 1972, but serious shortcomings in that effort exist. In particular, not enough program identifying data is collected, so that the nature of the vocational program cannot be clearly established. Was the program offered in a comprehensive, a vocational or an area school? What is known about the past academic history of the student who completed the program? What motivated selection into the program? Many of the outcomes of vocational education that are not directly reflected in employment and earnings should receive increased attention. Further, there are significant groups that are not adequately sampled to allow sound conclusions about their success in the programs. We therefore recommend that the federal government improve and enlarge its data collection efforts and also provide an adequate source of funding for analysis of the data.

Incentives for services to special groups. The Carl Perkins Act directs attention to the vocational education needs of teenage parents, the handicapped, those with limited English proficiency, and race/ethnic minorities who have had an historic educational disadvantage, but does not provide adequate resources to act as a compelling incentive to serve them. The restrictions on the federal budget prevent major expansion of operating funds, but something is needed to encourage reallocation or alternative use of local funds to provide for these groups. We therefore recommend a continuation of the present emphasis on special needs populations in the Carl Perkins Act, but also a major national effort to educate the local and state service deliverers on the nature and breadth of the problems experienced by these groups,

and specific ways to use local resources to serve them. Video tapes, publications, and staff workshops should be widely encouraged and assisted.

Program continuation. The evidence on the effectiveness of high school vocational education for many young people argues for its continuation. The federal role in this regard is to encourage, rather than discourage that continuation. There are also problem areas that need improvement beyond those specific to the special groups. Among them are the need to find ways to use the vocational curriculum to enhance basic skills, both verbal and mathematical, and to assure that vocational graduates have the education that will keep their options open for changes in careers and in the workplace. We therefore recommend that the federal government maintain its incentives for program improvement and also encourage through funding the search for workable ways to enhance the quality of basic education received by vocational graduates without destroying the quality of the vocationally specific education now being received.

At the State Level

Research. At the state level, two kinds of research are needed. One is the ongoing monitoring of the state vocational program to assess its outcomes. The other is evaluative research that examines the effectiveness of innovations for improving the quality of instruction for those who concentrate in vocational courses in high school. We recommend that states establish or maintain units that can collect individual data on the school and labor market performance of high school graduates, and that they make available to local education agencies the technical personnel to assist and advise on adequate evaluation of local programs.

Program development. The states have a role in encouraging the development of improved programs whose objective is to flexibly educate the young people who follow the vocational curriculum. Providing a salable skill is neither a sufficient objective for employment nor one that will allow adequate response to the labor market in the long term. The simplistic response of merely requiring more credits fails to recognize that many young people have had trouble relating to much of the existing high school curriculum, and are not likely to respond successfully to an increased time investment in work at which they have already been unsuccessful. We therefore recommend that states encourage innovative instructional programs through providing incentive funding, establishing networks of available experts who can assist local agencies in developing programs, and recognizing these programs as they become operational.

Incentives for services to special groups. Under current practice, state education departments can control the flow of federal funds to local education agencies and prepare the budget recommendations that state legislatures adjust and transform into

appropriation bills. These provide vehicles that can influence what occurs at the local level. The research findings suggest that several program changes may be needed. First among them is to assure that the graduates of the high school vocational curriculum are also equipped with adequate basic skills for participation in a flexible job market. The large number of graduates who do not make direct use of their job specific training suggests that the function of vocational education should be viewed more broadly than a preliminary job preparation activity. Second, the degree to which informed decisions were made in the selection of curriculum is in question. State initiatives to improve counseling seem to be in order. Third, for some special groups, particularly the limited English proficient, there is a question of both awareness and access. Finally, the pervasive labor market disadvantage for women argues for state incentives that will improve the vocational offerings in terms of their preparation for better quality, higher paying jobs. Accordingly, we recommend that state leverages through budget control be directed toward improved awareness, improved counseling, enriched instructional programs, and program modification directed toward preparation for better jobs for the special groups.

Program continuation. There is clear evidence that, on the average, high school vocational education is followed by favorable labor market outcomes and that substantial numbers of its graduates are also successful in further postsecondary education. On the basis of these outcomes, it appears reasonable that the states should continue to support and encourage vocational education in the high school. One of the earlier recommendations speaks to state action to improve the quality of the vocational program, but there is no apparent justification for curtailing or reducing it. One movement in society that has such a negative potential is the increase in graduation requirements which emphasize academic courses thereby making it more difficult to schedule vocational courses. Such requirements can have the effect of debilitating the vocational program. We therefore recommend that state funding for vocational education be continued and that graduation requirements be constructed to preserve the option of completing sufficient vocational courses to continue the benefits of such a program.

At the Local Level

Research. It is extremely difficult to conduct generalizable research with small groups embedded within the context of a single agency. The options increase when larger groups of schools can combine together to examine the persistent questions about learning and teaching in the vocational setting. Evaluative research, however, should be an ongoing activity in each local unit, concerned with how the program is working in that setting with those resources, and those students. We therefore recommend that local agencies be alert for opportunities to collaborate with

other schools to conduct larger scale research efforts, while conducting a systematic follow-up and review of each of their own programs.

Program development. Local agencies should be concerned with expanding current efforts and finding new ways to integrate the educational program for all students, so that each can complete the high school years with significant preparation for continued learning in a changing work place. Possible avenues include collaborative efforts between academic and vocational teachers and structuring graduation requirements to emphasize flexibility and broad interest while retaining a sufficient core of both academic and vocational learning. Counseling should be opened up to include more employment counseling and not limited to those aspiring to immediate postsecondary enrollment. Providing teaching staff time away from school to meet with employers and assess their needs should be encouraged. The use of industry advisory committees in a genuinely contributing way is an effective tool in increasing training-related employment. Stated succinctly, our recommendations are that academic and vocational learning be integrated, that counseling be enlarged to include a component on employment, and that employer-teacher interaction should be encouraged.

Services to special groups. The disadvantage in employment for the special groups has been identified and verified in the research reviewed in this paper. While it cannot be entirely removed by action at the local school level, a corrective contribution is possible and necessary. For women, the development of programs that lead to better paying jobs is one avenue. For minorities and low SES students, the need to assure adequate basic skills as well as vocational skills is essential. For the LEP students, a concerted effort to identify, recruit, offer genuine choice, and necessary supportive services will go far to alleviate the disadvantage. We recommend that attention be concentrated on using local information and resources to accomplish these ends.

Program continuation. The preceding recommendations will significantly encourage the continuation of vocational programs at the high school level. One additional step might be taken to assure successful program maintenance. It is to systematically inform the community of the progress and success of vocational students. We therefore recommend that recognitions, progress reports, follow-up reports, and evaluations be published in newsletters and the local media on a regular basis.

REFERENCES

Campbell, Paul B.; Basinger, Karen S.; Dauner, Mary Beth; and Parks, Marie. Outcomes of Vocational Education for Women, Minorities, the Handicapped, and the Poor. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986.

Campbell, Paul B.; Elliot, Jack; Hotchkiss, Lawrence; Laughlin, Suzanne; and Seusy, Ellen. Antecedents of Training-Related Placement. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1987.

Campbell, Paul B.; Elliot, Jack; Laughlin, Suzanne; and Seusy, Ellen. Dynamics of Vocational Education Effects on Labor Market Outcomes. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1987.

Campbell, Paul B.; Orth, Mollie N.; and Seitz, Patricia. Patterns of Participation in Secondary Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1981.

Friedenberg, Joan E. The Condition of Vocational Education for Limited English-Proficient Persons in Selected Areas of the United States. Columbus: The National Center for Research in Vocational Education, The Ohio State University 1987.

Gardner, John A. Influences of High School Curriculum on the Determinants of Labor Market Experience. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984.

Hotchkiss, Lawrence. "How Working Part-time Affects Teenagers' School Activities and Career Expectations." Facts & Findings, 1 (21), Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Hotchkiss, Lawrence. Noneconomic Effects of Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University 1984.

Laughlin, Suzanne. "After High School--What Next?" Facts & Findings, 4 (12), Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986.

Lewis, Morgan V.; Gardner, John A.; and Seitz, Pat A. High School Work Experience and Its Effects. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Mertens, Donna M.; Seitz, Pat A.; and Cox, Sterling. Vocational Education and the High School Dropout. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

National Occupational Information Coordinating Committee. Vocational Preparation and Occupations, Vol. 1: Occupational and Educational Code Crosswalk. 3rd Edition, Washington, DC: National Occupational Information Coordinating Committee, 1982.

Office of Civil Rights. 1984 Vocational Education Civil Rights Survey--National Summary. Washington, DC: DBS Corporation, 1986.

Owings, Jeffrey, and Stocking, Carol. Characteristics of High School Students Who Identify Themselves as Handicapped. Washington, DC: National Center for Education Statistics, 1985.

Rumberger, Russell W., and Daymont, Thomas N. "The Economic Value of Academic and Vocational Training Acquired in High School." In Youth and the Labor Market, edited by Michael E. Borus. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1984.

Weber, James M. "Dropout Rates for Students in Different High School Curricula." Journal of Vocational Education Research, Vol. 13, no. 1., Spring, 1988. pp. 35-49.

Weber, James M. The Role of Vocational Education in Decreasing the Dropout Rate. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986.